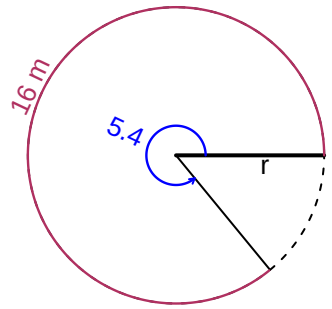
Name: Date:

Trig Final (TEST v681)

- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.

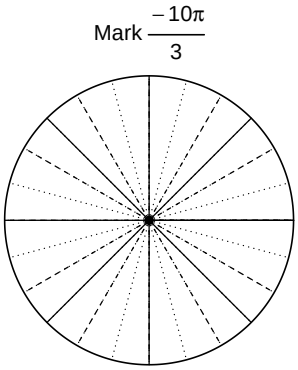
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 5.4 radians. The arc length is 16 meters. How long is the radius in meters?

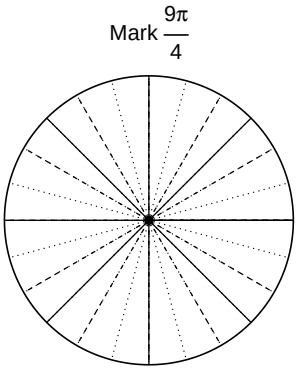


Question 2

Consider angles $\frac{-10\pi}{3}$ and $\frac{9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(\frac{-10\pi}{3}\right)$ and $\sin\left(\frac{9\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\cos(-10\pi/3)$



Find $\sin(9\pi/4)$

Question 3

If $\cos(\theta) = \frac{16}{65}$, and θ is in quadrant IV, determine an exact value for $\sin(\theta)$.

Question 4

A mass-spring system oscillates vertically with a midline at $y = 8.19$ meters, a frequency of 2.46 Hz, and an amplitude of 5.11 meters. At $t = 0$, the mass is at the minimum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).